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Aerial remote sensing used in soil moisture research by U of Montana man

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AERIAL REMOTE SENSING USED
IN SOIL MOISTURE RESEARCH
BY U OF MONTANA MAN

by Richard Weddle
U.M. Forestry Editor

MISSOULA, Mont.---

In an effort to better understand and manage the state's natural resources, a University of Montana researcher is exploring the use of aerial photography and remote heat sensing to measure and correlate soil moisture and temperature.

Fred L. Gerlach, 41, an associate professor in the UM School of Forestry, is nearing completion of a study in which various photographic film and filter combinations and electronic thermal images have provided valuable terrain and environmental information.

"The study," Gerlach said, "searches for a better understanding of new types of photography employing film and filter combinations and electronic thermal images as sources of terrain and environmental information."

The study, which began in 1965, is funded by the Office of Water Resources Research, U. S. Department of Interior and the Univeristy of Montana Forest and Conservation Experiment Station.

In one phase of the project, Gerlach, aided by research assistants, made on-the-ground measurements to determine the relationships between soil moisture and temperature. These data are used to cross-check the measurement of soil moisture by aerial infrared imagery.

In a second phase of the study, Gerlach, using aerial photographic techniques, is attempting to develop film-filter combinations which will provide needed moisture and water resource data.

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The UM faculty member and his team have evaluated the usefulness of various black and white, normal color, and infrared color exposures in supplying soil moisture and hydrologic information.

According to Gerlach, such information will facilitate improved soil moisture mapping systems and better methods of monitoring and controlling the distribution of irrigation water.

In addition, he said that because soil moisture often determines plant and tree species, the new aerial techniques will enable foresters to distinguish types of vegetation from the air.

Gerlach said such techniques will have numerous practical applications in the fields of water resource management, forestry, range management and engineering.

Gerlach, who is on a leave of absence from the University of Montana, is conducting a 15-month study of advanced aerial remote sensing systems at the University of Minnesota, Minneapolis, while he is studying for his doctorate in aerial photography and remote sensing systems.

A native of Versailles, Ohio, Gerlach attended Ohio State University, Columbus, and the University of Montana, where he earned a Bachelor of Science degree in forestry with honors in 1952.

He served in the U.S. Army Corps of Engineers from 1952-55. In 1957 he earned his master's degree in forestry on the Montana campus in Missoula and a decade later he participated in a short course in remote sensing of environment at the University of Michigan, Ann Arbor.

Gerlach is married to the former Margaret Kirkpatrick of Vancouver, B.C., Canada. The couple has three children, Clara, Bruce and Lori. The family is living at Coon Rapids, Minn., while Gerlach is completing his doctoral degree at Minnesota.

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